

Design of solar constant temperature and humidification system





Overview

Can a modified solar humidification–dehumidification desalination system reduce energy consumption?

A modified solar humidification–dehumidification desalination system based on hollow fiber membrane is proposed to achieve lower energy consumption. A dynamic model of this system is given and experimentally validated for daily practical operation. The transient performance during the startup period is analysed.

Does a solar humidifier have a transient behavior?

Transient behavior of the system is analysed by the model during the startup period. Both SWP and startup time decrease with shorter mean pore diameters, the lower porosity of the membrane, and higher packing fractions of the humidifier. SWP can be increased with the growth of solar collector areas, while the startup time also prolongs.

Is a solar collector and membrane-based humidifier hybrid HDH system possible?

Li and Zhang (2016) proposed a solar collector and membrane-based humidifier hybrid HDH system. A mathematical model of the system was developed to estimate the desalination performance, and the freshwater production of $25.88 \text{ kg m}^{-2} \text{ d}^{-1}$ was realized.

Can solar energy improve HDH and air conditioning hybrid seawater desalination?

Fouda et al. (2016) studied the dynamic behavior of an HDH and air conditioning hybrid seawater desalination system assisted by the solar energy. Cost saving analysis showed that this system has a better performance for hot and humid areas. Further, Abdel-Hady et al. (2019) proposed a model to enhance the HDH desalination process.



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In this paper, design recommendations for humidification-dehumidification solar desalination systems (HDHSDS) are given. The effect of mass flow rates and temperatures of saline water

[Transient performance of a solar humidification...](#)

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[Integration of Process Modeling, Design, and Optimization ...](#)

Sep 7, 2018 · Solar energy is becoming a promising source of heat and power for electrical generation and desalination plants. In this work, an integrated study of modeling, optimization, ...



[Full article: A parametric analysis of a solar humidification](#)

Feb 7, 2024 · This work examined the conceptual design of a solar HDH desalination system with a view to application in remote and decentralized locations. In this regard, a novel bio-inspired ...



[A 2E Analysis and Optimization of a Hybrid Solar](#)

Dec 2, 2025 · BSTRACT: This study presents an energy-exergy analysis of a Humidification-Dehumidification (HD) solar water desalination system. The extensive applicat on of the HD ...



Conceptual design and multi-optimization of small-scale solar ...

Jul 1, 2025 · In remote areas that face a shortage of freshwater and have fuel supply problems, freshwater production using solar desalination is a good option. The purpose of this study is to ...





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Jun 25, 2023 · The introduced system has different subsystems; solar dish collector, a re-compression sCO₂ Brayton cycle integrated with a combined Rankine power-ejector ...



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